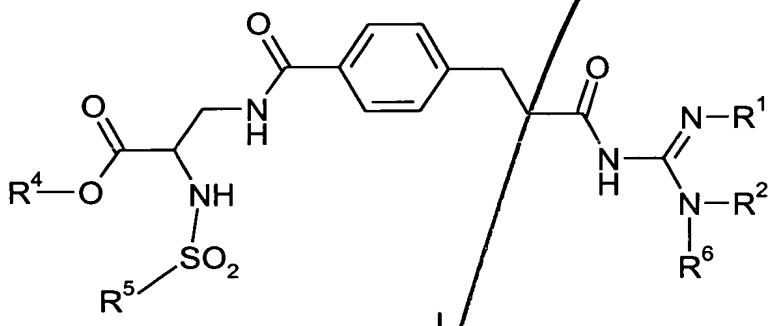
We claim:

1. A compound having the general formula I,



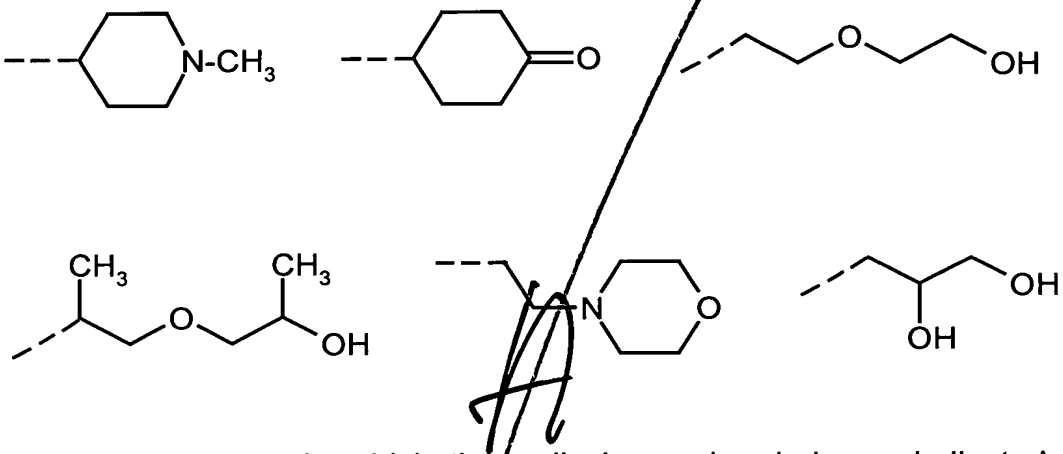
I

wherein:

R^1 and R^2 independently of one another are hydrogen or $(C_1\text{-}C_6)$-alkyl which is unsubstituted or substituted by R^3, or in which the radicals R^1- and R^2- together are a saturated or unsaturated bivalent $(C_2\text{-}C_9)$-alkylene radical which is unsubstituted or is substituted by one or more groups from the group consisting of halogen, $(C_1\text{-}C_6)$-alkyl, $(C_1\text{-}C_6)$-alkoxy, $(C_6\text{-}C_{14})$-aryl, $(C_6\text{-}C_{14})$-aryl-$(C_1\text{-}C_6)$-alkyl-, $(C_5\text{-}C_{14})$-heteroaryl, $(C_5\text{-}C_{14})$-heteroaryl-$(C_1\text{-}C_6)$-alkyl-, $(C_3\text{-}C_{12})$-cycloalkyl, $(C_3\text{-}C_{12})$-cycloalkyl-$(C_1\text{-}C_6)$-alkyl- and oxo, where a 5-membered to 7-membered saturated or unsaturated ring which is unsubstituted or is substituted by R^3 and which is a carbocyclic ring or a heterocyclic ring containing one or two ring nitrogen atoms, can be fused to a carbon-carbon bond in the $(C_2\text{-}C_9)$-alkylene radical;

R^3 is $(C_1\text{-}C_{10})$-alkyl, $(C_3\text{-}C_{20})$-monocycloalkyl, $(C_5\text{-}C_{20})$-bicycloalkyl, $(C_5\text{-}C_{20})$-tricycloalkyl, $(C_1\text{-}C_8)$-alkoxy, $(C_6\text{-}C_{14})$-aryl, $(C_6\text{-}C_{14})$-aryl-$(C_1\text{-}C_4)$-alkyl-, $(C_5\text{-}C_{14})$-heteroaryl, $(C_5\text{-}C_{14})$-heteroaryl-$(C_1\text{-}C_4)$-alkyl-, halogen, trifluoromethyl, cyano, hydroxyl, oxo, nitro, amino, -NH-$(C_1\text{-}C_4)$-alkyl, -N($(C_1\text{-}C_4)$-alkyl)$_2$, -NH-CO-$(C_1\text{-}C_4)$-alkyl, or -CO-$(C_1\text{-}C_4)$-alkyl;

R^4 is hydrogen, (C_1-C_6)-alkyl-CO-O-(C_1-C_4)-alkyl- or (C_1-C_6)-alkyl which is unsubstituted or is substituted by a radical selected from the group consisting of hydroxyl, (C_1-C_4)-alkoxy, (C_1-C_4)-alkyl-$S(O)_2$-, $-NR^7R^{7'}$ and $-N^+R^7R^{7'}R^{7''}\,Q^-$, where R^7, $R^{7'}$ and $R^{7''}$ independently of one another are hydrogen, (C_1-C_6)-alkyl, (C_5-C_{14})-aryl or (C_5-C_{14})-aryl-(C_1-C_6)-alkyl- and Q^- is a physiologically tolerable anion, or in which R^4 is one of the radicals



in which the bonds, via which the radicals are bonded, are indicated by dashed lines;

R^5 is (C_1-C_{20})-alkyl, (C_3-C_{20})-monocycloalkyl, (C_5-C_{20})-bicycloalkyl, (C_5-C_{20})-tricycloalkyl, (C_6-C_{14})-aryl, (C_5-C_{14})-heteroaryl, (C_6-C_{14})-aryl-(C_1-C_6)-alkyl- or (C_5-C_{14})-heteroaryl-(C_1-C_6)-alkyl-, wherein one or more carbon atoms of the alkyl radical, the monocycloalkyl radical, the bicycloalkyl radical and the tricycloalkyl radical is optionally replaced by identical or different atoms selected from the group consisting of nitrogen, oxygen and sulfur, and wherein the aryl radical, the heteroaryl radical, the alkyl radical, the monocycloalkyl radical, the bicycloalkyl radical and the tricycloalkyl radical each is unsubstituted or is substituted by one, two or three radicals R^3; and

R^6 is hydrogen, (C_1-C_6)-alkyl-O-CO-, hydroxyl, (C_1-C_6)-alkyl-O-CO-O- or nitro;

in all its stereoisomeric forms and mixtures thereof in all ratios, and its physiologically tolerable salts and prodrugs.

2. A compound according to claim 1, wherein

R^1 and R^2 are hydrogen or together are a saturated or unsaturated bivalent $(C_2$-$C_5)$-alkylene radical, wherein the $(C_2$-$C_5)$-alkylene radical is unsubstituted or is substituted by a radical selected from the group consisting of halogen, $(C_1$-$C_6)$-alkyl, $(C_1$-$C_6)$-alkoxy, $(C_6$-$C_{14})$-aryl, $(C_6$-$C_{14})$-aryl-$(C_1$-$C_6)$-alkyl-, $(C_5$-$C_{14})$-heteroaryl, $(C_5$-$C_{14})$-heteroaryl-$(C_1$-$C_6)$-alkyl-, $(C_3$-$C_{12})$-cycloalkyl, $(C_3$-$C_{12})$-cycloalkyl-$(C_1$-$C_6)$-alkyl- and oxo, and where a 5-membered to 7-membered saturated or unsaturated ring which is unsubstituted or substituted by R^3 and which is a carbocyclic ring or heterocyclic ring containing one or two ring nitrogen atoms, is optionally fused to a carbon-carbon bond in the $(C_2$-$C_5)$-alkylene radical;

R^3 is $(C_1$-$C_{10})$-alkyl, $(C_3$-$C_{20})$-monocycloalkyl, $(C_5$-$C_{20})$-bicycloalkyl, $(C_5$-$C_{20})$-tricycloalkyl, $(C_1$-$C_8)$-alkoxy, $(C_6$-$C_{14})$-aryl, $(C_5$-$C_{14})$-heteroaryl, $(C_6$-$C_{14})$-aryl-$(C_1$-$C_4)$-alkyl-, $(C_5$-$C_{14})$-heteroaryl-$(C_1$-$C_4)$-alkyl-, halogen, trifluoromethyl, cyano, oxo, -N$((C_1$-$C_4)$-alkyl$)_2$ or -NH-CO-$(C_1$-$C_4)$-alkyl;

R^4 is hydrogen or $(C_1$-$C_6)$-alkyl which is unsubstituted or is substituted by a radical selected from the group consisting of $(C_1$-$C_4)$-alkoxy, $(C_1$-$C_4)$-alkyl-$S(O)_2$- and $NR^7R^{7'}$, where R^7 and $R^{7'}$ independently of one another are hydrogen or $(C_1$-$C_4)$-alkyl;

R^5 is $(C_1$-$C_{20})$-alkyl, $(C_3$-$C_{20})$-monocycloalkyl, $(C_5$-$C_{20})$-bicycloalkyl, $(C_5$-$C_{20})$-tricycloalkyl, $(C_6$-$C_{14})$-aryl, $(C_5$-$C_{14})$-heteroaryl, $(C_6$-$C_{14})$-aryl-$(C_1$-$C_6)$-alkyl- or $(C_5$-$C_{14})$-heteroaryl-$(C_1$-$C_6)$-alkyl-, wherein the aryl radical, the heteroaryl radical, the alkyl radical, the monocycloalkyl radical, the bicycloalkyl radical and the tricycloalkyl radical each is unsubstituted or is substituted by one, two or three radicals R^3; and

R^6 is hydrogen or $(C_1$-$C_6)$-alkyl-O-CO-.

3. A compound according to claim 1, wherein

R^1 and R^2 are hydrogen or together are a saturated or unsaturated bivalent $(C_2$-$C_4)$-alkylene radical, wherein the $(C_2$-$C_4)$-alkylene radical is unsubstituted or is substituted by a radical selected from the group consisting of halogen, $(C_1$-$C_6)$-alkyl, $(C_1$-$C_6)$-alkoxy, $(C_6$-$C_{14})$-aryl, $(C_6$-$C_{14})$-aryl-$(C_1$-$C_6)$-alkyl-, $(C_5$-$C_{14})$-heteroaryl, $(C_5$-$C_{14})$-heteroaryl-$(C_1$-$C_6)$-alkyl-, $(C_3$-$C_{12})$-cycloalkyl, $(C_3$-$C_{12})$-cycloalkyl-$(C_1$-$C_6)$-alkyl- and oxo, and wherein a 5-membered to 7-membered saturated or unsaturated ring which is unsubstituted or is substituted by R^3 and which is a carbocyclic ring or heterocyclic ring containing one or two ring nitrogen atoms, is optionally fused to a carbon-carbon bond in the $(C_2$-$C_4)$-alkylene radical;

R^3 is $(C_1$-$C_4)$-alkyl, $(C_3$-$C_{10})$-monocycloalkyl, $(C_5$-$C_{12})$-bicycloalkyl, $(C_5$-$C_{12})$-tricycloalkyl $(C_1$-$C_4)$-alkoxy, $(C_6$-$C_{14})$-aryl, $(C_6$-$C_{14})$-aryl-$(C_1$-$C_4)$-alkyl-, halogen, trifluoromethyl, cyano, oxo, -N$((C_1$-$C_4)$-alkyl$)_2$ or -NH-CO-$(C_1$-$C_4)$-alkyl;

R^4 is hydrogen or $(C_1$-$C_6)$-alkyl;

R^5 is $(C_1$-$C_{10})$-alkyl, $(C_3$-$C_{15})$-monocycloalkyl, $(C_5$-$C_{15})$-bicycloalkyl, $(C_5$-$C_{15})$-tricycloalkyl, $(C_6$-$C_{14})$-aryl, $(C_5$-$C_{14})$-heteroaryl, $(C_6$-$C_{14})$-aryl-$(C_1$-$C_6)$-alkyl- or $(C_5$-$C_{14})$-heteroaryl-$(C_1$-$C_6)$-alkyl-, wherein the aryl radical, the heteroaryl radical, the alkyl radical, the monocycloalkyl radical, the bicycloalkyl radical and the tricycloalkyl radical each is unsubstituted or is substituted by one, two or three radicals R^3; and

R^6 is hydrogen or $(C_1$-$C_4)$-alkyl-O-CO-.

4. A compound according to claim 1, wherein

R^1 and R^2 are hydrogen or together are a saturated or unsaturated bivalent $(C_2$-$C_3)$-alkylene radical, wherein the $(C_2$-$C_3)$-alkylene radical is unsubstituted or is substituted by a radical selected from the group consisting of halogen, $(C_1$-$C_6)$-alkyl, $(C_1$-$C_6)$-alkoxy, $(C_6$-$C_{14})$-aryl, $(C_6$-$C_{14})$-aryl-$(C_1$-$C_6)$-alkyl-, $(C_5$-$C_{14})$-heteroaryl, $(C_5$-$C_{14})$-heteroaryl-$(C_1$-$C_6)$-alkyl-, $(C_3$-$C_{12})$-cycloalkyl, $(C_3$-$C_{12})$-cycloalkyl-$(C_1$-$C_6)$-alkyl- and oxo, and wherein a 5-membered to 7-membered saturated or unsaturated ring which is unsubstituted or is substituted by R^3 and which is a carbocyclic ring or heterocyclic ring containing one or two ring nitrogen atoms, is optionally fused to a carbon-carbon bond in the $(C_2$-$C_3)$-alkylene radical;

R^3 is $(C_1$-$C_4)$-alkyl, $(C_3$-$C_{10})$-monocycloalkyl, $(C_5$-$C_{12})$-bicycloalkyl, $(C_5$-$C_{12})$-tricycloalkyl $(C_1$-$C_4)$-alkoxy, $(C_6$-$C_{14})$-aryl, halogen, trifluoromethyl, cyano, oxo, -N$((C_1$-$C_4)$-alkyl$)_2$ or -NH-CO-$(C_1$-$C_4)$-alkyl;

R^4 is hydrogen or $(C_1$-$C_6)$-alkyl;

R^5 is $(C_1$-$C_{10})$-alkyl, $(C_3$-$C_{15})$-monocycloalkyl, $(C_5$-$C_{15})$-bicycloalkyl, $(C_5$-$C_{15})$-tricycloalkyl, $(C_6$-$C_{14})$-aryl, $(C_5$-$C_{14})$-heteroaryl, $(C_6$-$C_{14})$-aryl-$(C_1$-$C_6)$-alkyl- or $(C_5$-$C_{14})$-heteroaryl-$(C_1$-$C_6)$-alkyl-, wherein the aryl radical, the heteroaryl radical, the alkyl radical, the monocycloalkyl radical, the bicycloalkyl radical and the tricycloalkyl radical each is unsubstituted or is substituted by one, two or three radicals R^3; and

R^6 is hydrogen or $(C_1$-$C_4)$-alkyl-O-CO-.

5. A compound according to claim 1, wherein

R^5 is $(C_6$-$C_{14})$-aryl or $(C_5$-$C_{14})$-heteroaryl, where the aryl radical and the heteroaryl radical each is unsubstituted or is substituted by one, two or three identical or different radicals R^3; and

R^3 is (C_1-C_{10})-alkyl, (C_3-C_{20})-monocycloalkyl, (C_5-C_{20})-bicycloalkyl, (C_5-C_{20})-tricycloalkyl, (C_1-C_8)-alkoxy, (C_6-C_{14})-aryl, (C_6-C_{14})-aryl-(C_1-C_4)-alkyl-, (C_5-C_{14})-heteroaryl, (C_5-C_{14})-heteroaryl-(C_1-C_4)-alkyl-, halogen, trifluoromethyl, cyano, hydroxyl, oxo, nitro, amino, -NH-(C_1-C_4)-alkyl, -N$((C_1-C_4)$-alkyl$)_2$, -NH-CO-(C_1-C_4)-alkyl, or -CO-(C_1-C_4)-alkyl.

6. A compound according to claim 1, wherein R^5 is a naphthyl radical.

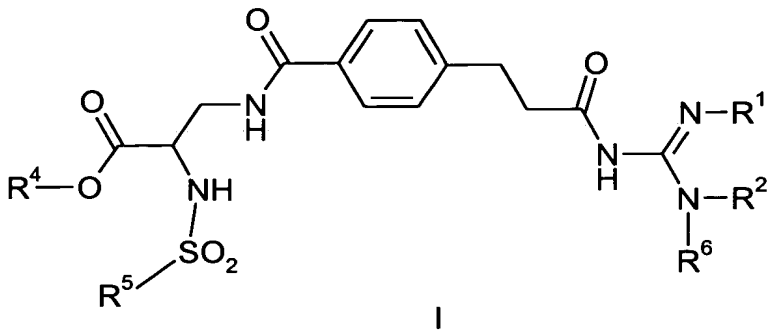
7. A compound according to claim 1, wherein said compound is 2-(R^5-sulfonylamino)-3-(4-(2-(1,4,5,6-tetrahydropyrimidin-2-ylcarbamoyl)-ethyl)-benzoylamino) propionic acid wherein the 2-(R^5-sulfonylamino) substituent is selected from the group consisting of benzenesulfonylamino, 4-(n-propyl)benzenesulfonylamino, 4-tert-butylbenzenesulfonylamino, 2,4,6-trimethylbenzenesulfonylamino, 4-methoxybenzenesulfonylamino, 4-(n-butoxy)benzenesulfonylamino, 3-chlorobenzenesulfonylamino, 4-chlorobenzenesulfonylamino, 3-trifluoromethylbenzenesulfonylamino, 4-trifluoromethylbenzenesulfonylamino, 4-acetylaminobenzenesulfonylamino, 2-cyanobenzenesulfonylamino, naphthalene-1-sulfonylamino, naphthalene-2-sulfonylamino, biphenyl-4-sulfonylamino, thiophene-2-sulfonylamino, quinoline-8-sulfonylamino, methanesulfonylamino, propane-1-sulfonylamino, propane-2-sulfonylamino, butane-1-sulfonylamino, 2-methylpropane-1-sulfonylamino, chloromethanesulfonylamino, 2,2,2-trifluoroethanesulfonylamino, 7,7-dimethyl-2-oxo-bicyclo[2.2.1]hept-1-ylmethanesulfonylamino and 2-phenylethenesulfonylamino, or a stereoisomer or mixture of stereoisomers in any ratio, or a physiologically tolerable salt or prodrugs thereof.

8. A compound according to claim 1, wherein said compound is (2S)-2-(naphthalene-1-sulfonylamino)-3-(4-(2-(1,4,5,6-tetrahydropyrimidin-2-ylcarbamoyl)-ethyl)benzoylamino)propionic acid or a physiologically tolerable salt or prodrug thereof.

9. A compound according to claim 1, wherein said compound is (2S)-2-(naphthalene-1-sulfonylamino)-3-(4-(2-(1,4,5,6-tetrahydropyrimidin-2-ylcarbamoyl)-ethyl)benzoylamino)propionic acid, or a (C_1-C_4)-alkyl ester thereof, or a physiologically tolerable salt of said acid or ester thereof.

10. A compound according to claim 1, wherein said compound is (2S)-2-(naphthalene-1-sulfonylamino)-3-(4-(2-(1,4,5,6-tetrahydropyrimidin-2-ylcarbamoyl)-ethyl)benzoylamino)propionic acid ethyl ester, or a physiologically tolerable salt thereof.

11. A process for the preparation of a compound having the general formula I,



I

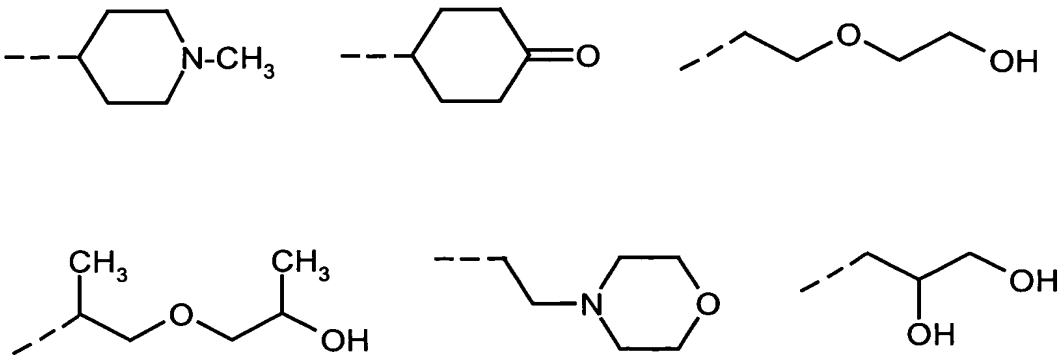
wherein:

R^1 and R^2 independently of one another are hydrogen or (C_1-C_6)-alkyl which is unsubstituted or substituted by R^3, or in which the radicals R^1- and

R^{2-} together are a saturated or unsaturated bivalent (C_2-C_9)-alkylene radical which is unsubstituted or is substituted by one or more groups from the group consisting of halogen, (C_1-C_6)-alkyl, (C_1-C_6)-alkoxy, (C_6-C_{14})-aryl, (C_6-C_{14})-aryl-(C_1-C_6)-alkyl-, (C_5-C_{14})-heteroaryl, (C_5-C_{14})-heteroaryl-(C_1-C_6)-alkyl-, (C_3-C_{12})-cycloalkyl, (C_3-C_{12})-cycloalkyl-(C_1-C_6)-alkyl- and oxo, where a 5-membered to 7-membered saturated or unsaturated ring which is unsubstituted or is substituted by R^3 and which is a carbocyclic ring or a heterocyclic ring containing one or two ring nitrogen atoms, can be fused to a carbon-carbon bond in the (C_2-C_9)-alkylene radical;

R^3 is (C_1-C_{10})-alkyl, (C_3-C_{20})-monocycloalkyl, (C_5-C_{20})-bicycloalkyl, (C_5-C_{20})-tricycloalkyl, (C_1-C_8)-alkoxy, (C_6-C_{14})-aryl, (C_6-C_{14})-aryl-(C_1-C_4)-alkyl-, (C_5-C_{14})-heteroaryl, (C_5-C_{14})-heteroaryl-(C_1-C_4)-alkyl-, halogen, trifluoromethyl, cyano, hydroxyl, oxo, nitro, amino, -NH-(C_1-C_4)-alkyl, -N$((C_1-C_4)$-alkyl$)_2$, -NH-CO-(C_1-C_4)-alkyl, or -CO-(C_1-C_4)-alkyl;

R^4 is hydrogen, (C_1-C_6)-alkyl-CO-O-(C_1-C_4)-alkyl- or (C_1-C_6)-alkyl which is unsubstituted or is substituted by a radical selected from the group consisting of hydroxyl, (C_1-C_4)-alkoxy, (C_1-C_4)-alkyl-$S(O)_2$-, $-NR^7R^{7'}$ and $-N^+R^7R^{7'}R^{7''}\,Q^-$, where R^7, $R^{7'}$ and $R^{7''}$ independently of one another are hydrogen, (C_1-C_6)-alkyl, (C_5-C_{14})-aryl or (C_5-C_{14})-aryl-(C_1-C_6)-alkyl- and Q^- is a physiologically tolerable anion, or in which R^4 is one of the radicals



in which the bonds, via which the radicals are bonded, are indicated by dashed lines;

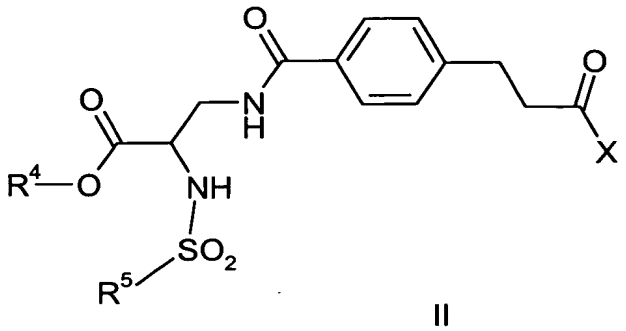
R^5 is $(C_1\text{-}C_{20})$-alkyl, $(C_3\text{-}C_{20})$-monocycloalkyl, $(C_5\text{-}C_{20})$-bicycloalkyl, $(C_5\text{-}C_{20})$-tricycloalkyl, $(C_6\text{-}C_{14})$-aryl, $(C_5\text{-}C_{14})$-heteroaryl, $(C_6\text{-}C_{14})$-aryl-$(C_1\text{-}C_6)$-alkyl- or $(C_5\text{-}C_{14})$-heteroaryl-$(C_1\text{-}C_6)$-alkyl-, wherein one or more carbon atoms of the alkyl radical, the monocycloalkyl radical, the bicycloalkyl radical and the tricycloalkyl radical is optionally replaced by identical or different atoms selected from the group consisting of nitrogen, oxygen and sulfur, and wherein the aryl radical, the heteroaryl radical, the alkyl radical, the monocycloalkyl radical, the bicycloalkyl radical and the tricycloalkyl radical each is unsubstituted or is substituted by one, two or three radicals R^3; and

R^6 is hydrogen, $(C_1\text{-}C_6)$-alkyl-O-CO-, hydroxyl, $(C_1\text{-}C_6)$-alkyl-O-CO-O- or nitro;

in all their stereoisomeric forms and mixtures thereof in all ratios, and their physiologically tolerable salts and their prodrugs,

comprising linking two or more fragments which can be derived retrosynthetically from the compound of formula I.

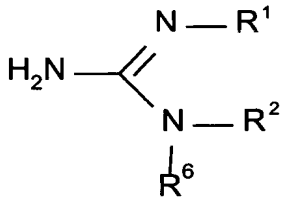
12. A process according to claim 11, comprising reacting a carboxylic acid or a carboxylic acid derivative of formula II,



II

wherein R^4 and R^5 are defined as in claim 11, or alternatively functional groups are present in the form of precursors or in protected form, and X is a nucleophilically substitutable leaving group;

with a guanidine or guanidine derivative of the formula III,



III

wherein R^1, R^2 and R^6 are defined as in claim 11, or alternatively functional groups are present in the form of precursors or in protected form.

13. A pharmaceutical composition comprising at least one compound according to claim 1 and a pharmaceutically acceptable carrier.

14. A pharmaceutical composition comprising at least one compound according to claim 10 and a pharmaceutically acceptable carrier.

15. A method of treating or preventing a disease characterized by or influenced by an interaction between a vitronectin receptor and a ligand in cell-cell interaction processes or cell-matrix interaction processes comprising administering to a subject in need thereof a compound according to claim 1.

16. A method of inhibiting bone resorption comprising administering to a subject in need thereof a compound according to claim 1.

17. A method of treating or preventing osteoporosis, hypercalcemia, or osteopenia comprising administering to a subject in need thereof a compound according to claim 1.

18. A method of inhibiting tumor growth or metastasis comprising administering to a subject in need thereof a compound according to claim 1.

19. A method of treating or preventing inflammation, cardiovascular disorders, restenosis, arteriosclerosis, nephropathies or retinopathies comprising administering to a subject in need thereof a compound according to claim 1.

20. A method of affecting an interaction between a vitronectin receptor and a ligand in cell-cell interaction processes or cell-matrix interaction processes comprising contacting a compound according to claim 1 with the surface of a cell that expresses said receptor, wherein said compound binds to said receptor, thereby affecting the interaction of said receptor and said ligand.

21. A method of affecting an interaction between a vitronectin receptor and a ligand in cell-cell interaction processes or cell-matrix interaction processes according to claim 20, wherein said effect is the inhbition of said cell's ability to bind said ligand and wherein said ligand is bone matrix.

22. A method of affecting an interaction between a vitronectin receptor and a ligand in cell-cell interaction processes or cell-matrix

interaction processes according to claim 20, wherein said method is carried out in vitro.

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